Implicit time discretization for the mean curvature flow of mean convex sets

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Abstract. In this note we analyze the Almgren-Taylor-Wang scheme for mean curvature flow in the case of mean convex initial conditions. We show that the scheme preserves strict mean convexity and, by compensated compactness techniques, that the arrival time functions converge strictly in BV. In particular, this establishes the convergence of the time-integrated perimeters of the approximations. As a corollary, the conditional convergence result of Luckhaus-Sturzenhecker becomes unconditonal in the mean convex case.